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form. Claims 10, 13 and 14 depend from independent claim 1, whereas claim 30 depends from independent claim 29. Claim 1 has been amended and applicant requests reconsideration of claim 1 and its dependent claims 2-4, 6-15, 18, 33-35 and new claim 37 in view of the following remarks. Claim 30 has been cancelled and its substance has been incorporated into claim 29. Therefore, claim 29 as amended should be allowable.

Applicant would like to thank the Examiner for the courtesy of a telephone interview between John Conklin, one of applicant's attorneys, and Examiner Dixon on December 18, 1991. During that interview the above-identified applied prior art patents were discussed with respect to a proposed amended claim 1. No agreement was reached.

Turning to the rejection of claims 1-9, 11, 12, 15-29 and 31-36, applicant understands the gist of the rejection to be as follows: At the time of the invention of the application, it was well known to provide apparatus on-board a haulage vehicle for monitoring the load carried by the vehicle. Examples of such weighing systems are illustrated in the Gamble, Miller and Griffiths patents. In each of these weighing systems, the weight carried by the vehicle is recorded and a historical record is kept in a storage medium. In the Gamble patent, the storage medium is a paper chart. In the Miller and Griffiths

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patents, an electronic storage medium is employed.

According to the Office Action, it would be obvious to modify and expand the load monitoring systems in each of the foregoing patents in order to provide a vehicle management and monitoring system as claimed by applicant in view of the teachings in the Juhasz et al. patent. In this regard, the Office Action takes the position that it would be obvious in view of the Juhasz et al. teachings to monitor "numerous quantities along with vehicular load . . . depending on the specifics of the vehicle and its use by an operator and/or owner."

In response to the rejection in the Office Action, applicant has amended the claims in order to more precisely focus on the on-board processing of information indicative of the performance of a haulage vehicle during its execution of haul cycles in its working environment. In applicant's invention, a processor on-board a vehicle receives load data from a weight sensing device and also receives data from a second source, which has a status that varies over the course of a haul cycle as set forth in amended claim 1. By monitoring parameters that vary over a haul cycle, applicant has developed a system that accurately monitors the work done by a haulage vehicle. With this accurate information in hand, a historical data base can be accumulated and a vehicle management system

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developed to best exploit and evaluate the efforts or work done by the vehicle.

To say that the Juhasz et al. patent suggests applicant's invention of recording accurate haul cycle information and creating a historical data base of this information as called for in amended claim 1 is to unfairly trivialize applicant's contribution to the art. In this regard, the heavy-duty vehicle industry has in the last few years adopted vehicle management systems of the type disclosed and claimed by applicant. The first of these systems, however, was developed and commercialized by applicant. Applicant's systems are after-market systems, which are sold to the end users of the vehicles. These systems measure and record haul cycle information. Vehicle manufacturers are now including systems similar to applicant's as part of the original equipment for their off-road haulage vehicles. In this regard, one of the major manufacturers of off-road haulage vehicles recently entered into a licensing agreement with applicant wherein the manufacturer was granted a license under U.S. Patent Nos. 4,839,835 and 4,831,539 patent owned by applicant and also under any patent that issues from the presently pending application. Applicant is presently in the preliminary process of negotiating with the other major manufacturers of off-road haulage vehicle for licenses

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under the same '835 and '539 patents and the presently pending application.

If the Examiner believes it would aid in the favorable reconsideration of the application, applicant is prepared to file a Rule 132 affidavit setting forth the specifics of the commercial success enjoyed by this invention for consideration by the Examiner. In this regard, the success of this invention results from the realization that collecting raw data and processing it to obtain haul cycle data provides useful information for evaluating the effectiveness of the vehicle's usage and also provides a basis for determining how the usage can be changed to improve the effectiveness of the vehicle.

As amended, applicant's claims call for a processor on-board the vehicle to receive load data and data from some other parameter that varies over a haul cycle. Claim 1 is generic, whereas remaining independent claims 20-24, 27 and 29 recite a specific variable parameter. The data collected by the processor is used by it to generate a set of haul cycle data that is accumulated in a historical data base for the purpose of accurately monitoring the work done by the haulage vehicle. None of the patents suggests accumulating raw data from parameters that vary over a haul cycle, processing that data and providing a unique set of data that defines the haul cycles in a predetermined manner intended to facilitate control and

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analysis of the vehicle in its working environment.

Instead, each of the primary references (Gamble, Miller and Griffiths) merely accumulate raw weight data in a storage medium without processing the data in order to provide haul cycle information that can be analyzed and used to control the vehicle in its working environment.

Furthermore, the secondary reference, the Juhasz et al. patent, merely provides a teaching that various engine parameters in a haulage vehicle may be monitored and downloaded to a remote site. There is nothing in the teachings of the Juhasz et al. patent that would suggest monitoring parameters related to the haul cycles of the vehicle, generating unique data from those parameters and accumulating that unique data in a historical data base for use in analyzing and controlling the movement of the vehicle in its working environment. Like the system disclosed in the Miller patent, the on-board processor in the Juhasz et al. patent merely compares data from predetermined parameters (e.g., engine performance parameters in Juhasz et al.) with threshold values for the purpose of ensuring the vehicle is operating within a safe range of values for each parameter.

It is respectfully submitted that any reasonable interpretation of the combined teachings of Gamble, Miller, Griffiths and Juhasz et al. merely suggests the monitoring of the load carried by a haulage vehicle in

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combination with the monitoring of various engine parameters as taught by the Juhasz et al. patent. Without the benefit of applicant's own teachings, there is no suggestion in the combination of these prior art patents that load data combined with other haul-cycle varying parameters can provide useful haul cycle information for monitoring and analyzing the work done by a haulage vehicle.

As applicant understands the argument in paragraph 10 of the Office Action, it appears to take the position that the applied references render obvious the monitoring of virtually any parameter of a haulage vehicle for any ultimate purpose. Applicant must strongly object to this broad interpretation of the teachings in the primary and secondary references. As indicated above, a fair reading of the references only suggests the simply monitoring and recording of the load carried by a vehicle in combination with the monitoring of engine parameters relative to threshold values. This is not applicant's claimed invention.

In the Juhasz et al. patent, each of the parameters sensed and recorded by the on-board processing system disclosed in the patent are indicative of either engine parameters or general vehicle information such as total miles travelled and average speed. None of the measured parameters varies in accordance with the haul cycles of

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the vehicle. Specifically, the Examiner's attention is directed to columns 5 and 6 of the Juhasz et al. patent wherein Tables I and II provide representative examples of the type of parameters measured by the system and the type of reports generated from these measured parameters. These tables clearly indicate that the type of data measured and the information accumulated has no relation at all to the haul cycles of the vehicle. Similarly, Table III in column 7 lists many different parameters measured by the invention in the Juhasz et al. patent, but none of these parameters provides any information concerning the haul cycles of the vehicle. In contrast to the type of parameters measured and recorded in the Juhasz et al. patent, applicant's claimed invention provides for the sensing of parameters that vary during the haul cycles of the vehicle. The electronic processing means on-board the vehicle processes this data and provides data which defines "haulage events executed by the vehicle during haulage cycles." This on-board processing of haul cycle related parameters in order to provide data that defines haulage events executed by the vehicle during haul cycles is a feature of the claimed invention that cannot be found in any of the cited references.

In addition to the foregoing, the applied references taken either alone or in combination fail to suggest specific features set forth in many of the claims. For

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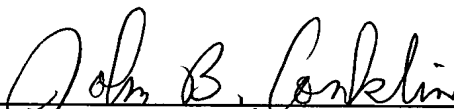
example, claim 22 expressly recites a second and third means as including devices for measuring distance travelled and for detecting a forward-neutral-reverse status of a drive train associated with the haulage vehicle. A first means detects the loading of the vehicle. There is not the remotest suggestion of such a combination of means in any of the references. With respect to paragraph ten of the Office Action, applicant understands the rejection of claim 20 to be based upon the broad assertion that the monitoring of any parameter that may be deemed useful for some ultimate purpose is considered obvious in view of the combined teachings of the applied prior art. This position assumes knowledge that is simply not in the references -- i.e., the desirability to collect data and process and organize it to provide a set of data indicative of haul cycle information. Such an assumption is inappropriate and tantamount to viewing applicant's invention with the benefit of hindsight.

Applicant has cancelled a number of claims in order to reduce the complexity of the claim set. Of the remaining independent claims, claims 1 and 20-24 have been amended. Independent claim 27 has not been amended, and its reconsideration in view of the foregoing comments is respectfully requested. As for the amended claims 1 and 20-24, each have been amended to more clearly recite a

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system that includes a processor for receiving data related to an underlying vehicle parameter that varies over haul cycles for the purpose of generating a set of data that defines haulage events executed by the vehicle during haul cycles. Collectively, these haulage events define haul cycles as defined in the specification. In conclusion, applicant has amended and abbreviated the claim set in response to the Office Action in order to more precisely focus the claimed invention on the monitoring of haul cycles executed by haulage vehicles in order to more clearly delineate the distinctions between applicant's invention and the applied prior art patents. This more focused claim set coupled with the foregoing arguments provide a clear record for distinguishing the present invention from the prior art and, accordingly, applicant respectfully requests favorable reconsideration of this application.

Signed at Chicago, in the County of Cook and State of Illinois this 19th day of December, 1991.



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